

ROBERT M. BELL**EDUCATION**

Ph.D., Statistics, 1980, Stanford University
M.S., Statistics, 1973, University of Chicago
B.S., Mathematics, 1972, Harvey Mudd College

PROFESSIONAL EXPERIENCE

1998-Present -- Principal Member Technical Staff, Statistics Research Department, AT&T Labs - Research, Florham Park, NJ
1991-1999 -- Senior Statistician, RAND, Santa Monica, California; Head, RAND Statistics Group (1993-1995); Member, RAND Graduate School Faculty (1991-1998)
1988-1991 -- Statistician, Social Policy Department, RAND, Santa Monica, California
1980-1988 -- Associate Statistician, Economics and Statistics Department, RAND, Santa Monica, California
1975-1979 -- Teaching Assistant/Research Assistant, Department of Statistics, Stanford University.
1973-1975 -- Consultant and Mathematical Assistant, Economics Department, The RAND Corporation, (also intermittently during educational leave).

RESEARCH AREAS

Experimental Design and Survey Development. Dr. Bell supervised statistical design of Project Alert, an experiment of drug abuse prevention in thirty California and Oregon junior high schools. This work has involved data collection and analysis for sample selection/assignment, development of a series of 30 page questionnaires, and design of sampling procedures for several secondary analyses.

Data Analysis. Dr. Bell supervised the main data analysis in Project ALERT. He previously supervised analysis of clinical data from the National Preventive Dentistry Demonstration Program, a study of school-based preventive treatments. Data from that study included one to five annual examinations of 30,000 children in 10 communities, over 10,000 replicate examinations, and 20,000 surveys.

Statistical Methodology. Dr. Bell's methodological interests include survey research methods, analysis of data from complex samples, record linkage methods, analysis of missing data, measurement and scaling, robust procedures, empirical Bayes estimation, and sample reuse methods.

PROFESSIONAL ORGANIZATIONS/HONORS

Elected Fellow, American Statistical Association, 1998.
Member, Committee on National Statistics, National Academy of Sciences, 2001-present.
Member, Panel to Review the 2000 Census, National Academy of Sciences, 1998-present.
Chair, American Statistical Association Subcommittee, Census Advisory Committee of Professional Associations, 1997-1998; Member, 1995-2000.
Member, Panel on Alternative Census Methodologies, National Academy of Sciences, 1995-1999.
Member, Committee on Minorities in Statistics, American Statistical Association, 1995-2000.
Member, Panel to Evaluate Alternative Census Methods, National Academy of Sciences, 1992-1994.
Visiting Lecturer for American Statistical Association, 1984-1986.
Program Chairman, Applied Statistics Workshop, Southern California Section of American Statistical Association, 1984.
Institute of Mathematical Statistics, since 1979.
American Statistical Association, since 1974.

PUBLICATIONS

Published Articles

- "School-Based Drug Prevention: Challenges in Designing and Analyzing Social Experiments," in *Public Policy and Statistics: Case Studies from RAND*, eds. S.C. Morton and J.E. Rolph, Springer-Verlag, New York, 2000.
- "Appropriateness of the Decision to Transfer Nursing Facility Residents to the Hospital," *Journal of the American Geriatric Society*, Vol. 48, 2000, 154-163 (Saliba, Kington, Buchanan, Bell, et al.).
- "A Clinically Detailed Risk Information System for Cost," *Health Care Financing Review*, Vol. 21, 2000, 1-27 (Carter, Bell Dubois, Goldberg, Keeler, McAlearney, Post, and Rumpel).
- "Cross-Lagged Relationships among Adolescent Problem Drug Use, Delinquent Behavior, and Emotional Distress," *Journal of Drug Issues*, Vol. 30, 2000, 283-304 (Bui, Ellickson, and Bell).
- "Adolescent Use of Illicit Drugs Other Than Marijuana: How Important is Social Bonding ant for Which Ethnic Groups?" *Substance Use and Misuse*, Vol. 34, 1999, 317-346 (Ellickson, Collins, and Bell).

"Simultaneous Polydrug Use among Teens: Prevalence and Predictors," *Journal of Substance Use*, Vol. 10, 1999, 233-253 (Collins, Ellickson, and Bell).

"Physician Response to Prenatal Substance Exposure," *Maternal and Child Health Journal*, 1999, 29-38 (Zellman, Bell, Archie, DuPlessis, Hoube, and Miu).

"Underuse and Overuse of Diagnostic Testing for Coronary Artery Disease in Patients Presenting with New-Onset Chest Pain," *American Journal of Medicine*, 1999, 391-398, (Carlisle, Leape, Bickel, Bell, et al.).

"Underuse of Cardiac Procedures: Do Women, Ethnic Minorities, and the Uninsured Fail to Receive Needed Revascularization?," *Annals of Internal Medicine*, Vol. 130, 1999, 183-192 (Leape, Hilborne, Bell, Kamberg, and Brook).

"The Sexual Practices of Asian and Pacific Islander High School Students," *Journal of Adolescent Health*, Vol. 23, 1998, 221-231 (Schuster, Bell, Nakajima, and Kanouse).

"Does Early Drug Use Increase the Risk of Dropping out of High School?," *Journal of Drug Issues*, Vol. 28, 1998, 357-380 (Ellickson, Bui, Bell, and McGuigan).

"Impact of a High School Condom Availability Program on Sexual Attitudes and Behaviors," *Family Planning Perspectives*, Vol. 30, 1998, 67-72 & 88 (Schuster, Bell, Berry, and Kanouse).

"Analytic Versus Holistic Scoring of Science Performance Tasks," *Applied Measurement in Education*, Vol. 11, 1998, 121-137 (Klein, Stecher, Shavelson, McCaffrey, Ormseth, Bell, Comfort, and Othman).

"Influencing Physician Response to Prenatal Substance Exposure Through State Legislation and Work-Place Policies," *Addiction*, Vol. 92, 1997, 1123-1131 (Zellman, Jacobson, and Bell).

"Adjusting Cesarean Delivery Rates for Case Mix," *Health Services Research*, Vol. 32, 1997, 509-526. (Keeler, Park, Bell, Gifford, and Keesey).

"Students' Acquisition and Use of School Condoms in a High School Condom Availability Program," *Pediatrics*, Vol. 100, October 1997, 689-694 (Schuster, Bell, Berry, and Kanouse).

"Impact Of Response Options And Feedback About Response Inconsistencies On Alcohol Use Self-Reports By Microcomputer," *Journal of Alcohol and Drug Education*, Vol. 42, 1997, 1-18 (Hays, Bell, Gillogly, Hill, Giroux, Davis, Lewis, Damush, and Nicholas).

"Adjusting for Attrition in School-Based Samples: Bias, Precision, and Cost Trade-Offs of Three Methods," *Evaluation Review*, Vol. 21, October 1997, 554-567 (McGuigan, Ellickson, Hays, and Bell).

"Teenagers and Alcohol Misuse in the United States: By any Definition, it's a Big Problem," *Addiction*, Vol. 91, 1996, 1489-1506 (Ellickson, McGuigan, Adams, Bell, and Hays).

"Communication Between Adolescents and Physicians About Sexual Behavior and Risk Prevention," *Archives of Pediatrics and Adolescent Medicine*, Vol. 150, 1996, 906-913 (Schuster, Bell, Petersen, and Kanouse).

"The Sexual Practices of Adolescent Virgins: Genital Sexual Activities of High School Students Who Have Never Had Vaginal Intercourse," *American Journal of Public Health*, Vol. 86, 1996, 1570-1576 (Schuster, Bell, and Kanouse).

"How Will the NCAA's New Standards Affect Minority Student-Athletes?," *Chance*, Vol. 8, 18-21, Summer 1995 (Klein and Bell).

"Discussion of Census 2000: Statistical Issues in Reengineering the Decennial Census," *Proceedings of the Social Statistics Section, American Statistical Association*, 1995, 17-18 (Bell).

"Effects of Reporting Methods on Infant Mortality Rate Estimates for Racial and Ethnic Subgroups," *Journal of Health Care for the Poor and Underserved*, Vol. 6, 1995, 60-75 (Farley, Richards, and Bell).

"Do Response Options Influence Self-Reports of Alcohol Use?," *The International Journal of the Addictions*, Vol. 29, 1994, 1909-1920 (Hays, Bell, Damush, Hill, DiMatteo, and Marshall).

"The Utility of Multiple Raters and Tasks in Science Performance Assessments," *Educational Assessment*, Vol. 2, 1994, 257-272 (Saner, Klein, Bell, and Comfort).

"Sampling and Statistical Estimation in the Decennial Census," *Proceedings of the Section on Survey Research Methods, American Statistical Association*, 1994, 71-79 (Bell).

"The Impact of Response Options and Location in a Microcomputer Interview on Drinking Drivers' Alcohol Use Self-Reports," *Alcohol and Alcoholism*, Vol. 29, 1994, 203-209 (Hays, Bell, Hill, Gillogly, Lewis, Marshall, Nicholas, and Marlatt).

"The Urge to Merge: Linking Vital Statistics Records and Medicaid Claims," *Medical Care*, Vol. 32, 1994, 1004-1018, reprinted by invitation in *Yearbook of Medical Informatics*, 1995, 366-380 (Bell, Keesey, and Richards).

"The 1966 Enactment of Medicare: Its Effect on Discharges from Los Angeles County-Operated Hospitals," *American Journal of Public Health*, Vol. 84, 1994, 1325-1327 (Glassman, Bell, and Tranquada).

"The Urge to Merge: A Computational Method for Linking Datasets with No Unique Identifier," *Proceedings of the 18th Annual SAS Users' Group International Conference, 1993* (Bell, Keeseey, and Richards).

"Using Response Agreement to Evaluate Suspect Links on a Longitudinal Survey," *Proceedings of Section on Survey Research Methods, American Statistical Association, 1993*, 286-291 (Bell).

"Changing Adolescent Propensities to Use Drugs: Results from Project ALERT," *Health Education Quarterly*, Vol. 20, 1993, 227-242 (Ellickson, Bell, and Harrison).

"Response Times for the CAGE, Short-MAST, AUDIT, and JELLINEK Alcohol Scales," *Behavior Research Methods, Instruments, & Computers*, Vol. 25, 1993, 304-307 (Hays, Hill, Gillogly, Lewis, Bell, and Nicholas).

"Do Drug Prevention Effects Persist into High School? How Project ALERT Did with Ninth Graders," *Preventive Medicine*, Vol. 22, 1993, 463-483 (Bell, Ellickson, and Harrison).

"Preventing Adolescent Drug Use: Long Term Results of a Junior High Program," *American Journal of Public Health*, Vol. 83, 1993, 856-861 (Ellickson, Bell, and McGuigan).

"Stepping Through the Drug Use Sequence: Longitudinal Scalogram Analysis of Initiation and Regular Use," *Journal of Abnormal Psychology*, Vol. 101, 1992, 441-451 (Ellickson, Hays, and Bell).

"New DEALEs: Other Approximations of Life Expectancy," *Medical Decision Making*, Vol. 12, 1992, 307-311 (Keeler and Bell).

"A Microcomputer Assessment System (MAS) for Administering Computer-Based Surveys: Preliminary Results from Administration to Clients at an Impaired-Driver Treatment Program," *Behavior Research Methods, Instruments, & Computers*, Vol. 24, 1992, 358-365 (Hays, Gillogly, Hill, Lewis, Bell, and Nicholas).

"Challenges to Social Experiments: A Drug Prevention Example," *J. Res. in Crime and Delinquency*, Vol. 29, 1992, 79-101 (Ellickson and Bell).

"Preventing Drug Use among Young Adolescents," *The Education Digest*, Vol. 56, 1990, 63-67 (Ellickson and Bell).

"Assessing Cost Effects of Nursing-Home-based Geriatric Nurse Practitioners," *Health Care Financing Review*, Vol. 11, No. 3, 1990, 67-78 (Buchanan, Bell, Arnold, Witsberger, Kane, and Garrard).

"Drug Prevention in Junior High: A Multi-Site Longitudinal Test," *Science*, Vol. 247, 1990, 1299-1305 (Ellickson and Bell).

"A Case Study in Contesting the Conventional Wisdom: School Based Fluoride Mouthrinse Programs in the USA," *Community Dentistry and Oral Epidemiology*, Vol. 18, 1990, 46-54 (Disney, Bohannon, Klein, and Bell).

"Does Pooling Saliva for Cotinine Testing Save Money Without Losing Information?," *Journal of Behavioral Medicine*, Vol. 12, October 1989, 503-507 (Bell and Ellickson).

"Affirmative Action in Medical Education and its Effect on Howard and Meharry: A Study of the Class of 1975," *Journal of the National Medical Association*, Vol. 80, 1988, 153-158 (Klein, Bell, and Williams).

"Game-Theoretic Optimal Portfolios," *Management Science*, Vol. 34, 1988, 724-733 (Bell and Cover).

"Value Preferences for Nursing Home Outcomes," *The Gerontologist*, Vol. 26, 1986, 303-308 (Kane, Bell, and Riegler).

"Conjecture Versus Empirical Data: A Response to Concerns Raised about the National Preventive Dentistry Demonstration Program (Different Views)," *Am J. Public Health*, Vol. 76, 1986, 448-452 (Klein, Bohannon, Bell, Disney, and Graves).

"Effects of Affirmative Action in Medical Schools, a Study of the Class of 1975," *New England Journal of Medicine*, Vol. 313 (Special Article), 1985, 519-525 (Keith, Bell, Swanson, and Williams).

"The Cost and Effectiveness of School-Based Preventive Dental Care," *American Journal of Public Health*, Vol. 75, 1985, 382-391 (Klein, Bohannon, Bell, Disney, Foch, and Graves).

"Management and Evaluation of the Effects of Misclassification in a Controlled Clinical Trial," *Journal of Dental Research*, Vol. 63 (Special Issue), 1984, 731-734 (Bell and Klein).

"Predicting the Course of Nursing Home Patients: A Progress Report," *The Gerontologist*, Vol. 23, 1983, 200-206 (Kane, Bell, Riegler, Wilson, and Keeler).

"Assessing the Outcomes of Nursing-Home Patients," *Journal of Gerontology*, Vol. 38, 1983, 385-393 (Kane, Bell, Riegler, Wilson, and Kane).

“An Adaptive Choice of the Scale Parameter for M-Estimators of Location,” Ph.D. thesis, Stanford University, 1980 (Bell).

“Competitive Optimality of Logarithmic Investment,” *Mathematics of Operations Research*, Vol. 5, 1980, 161-166 (Bell and Cover).

National Academy of Sciences Panel Reports

Measuring a Changing Nation: Modern Methods for the 2000 Census, Panel to Evaluate Alternative Census Methodologies, National Research Council, Committee on National Statistics, Michael L. Cohen, Andrew A. White, and Keith F. Rust (Eds.), National Academy Press, Washington, D.C., 1999.

Preparing for the 2000 Census: Interim Report II, Panel to Evaluate Alternative Census Methodologies, National Research Council, Committee on National Statistics, Andrew A. White and Keith F. Rust (Eds.), National Academy Press, Washington, D.C., 1997.

Sampling in the 2000 Census: Interim Report I, Panel to Evaluate Alternative Census Methodologies, National Research Council, Committee on National Statistics, Andrew A. White and Keith F. Rust (Eds.), National Academy Press, Washington, D.C., 1996.

Counting People in the Information Age, Final Report, Panel to Evaluate Alternative Census Methods, Committee on National Statistics, Commission on Behavioral and Social Sciences and Education, National Research Council, National Academy Press, Washington, D.C., 1994.

A Census that Mirrors America, Interim Report, Panel to Evaluate Alternative Census Methods, Committee on National Statistics, Commission on Behavioral and Social Sciences and Education, National Research Council, National Academy Press, Washington, D.C. 1993.

RAND Publications

The Sexual Practices of Asian and Pacific Islander High School Students, RP-744, RAND, 1998 (Schuster, Bell, Nakajima, and Kanouse).

Analysis of Data from Complex Surveys (videorecording), Statistics Short Course Series, V-092, RAND, 1997 (McCaffrey and Bell).

Graphical Methods for Data Analysis, (videorecording), Statistics Short Course Series, V-022 through V-025, RAND 1996 (Bell and McCaffrey).

Defining Infants' Race and Ethnicity in a Study of Very Low Birthweight Infants, MR-191-AHCPR, RAND, 1993 (Farley, Richards, and Bell).

Do Teens Tell the Truth? The Validity of Self-Reported Tobacco Use in Adolescents, N-3291-CHF, RAND, July 1991 (Freier, Bell, and Ellickson).

How Accurate Are Adolescent Reports of Drug Use?, N-3189-CHF, RAND, May 1991 (Reinisch, Bell, and Ellickson).

Multiplying Inequalities, The Effects of Race, Social Class, and Tracking on Opportunities to Learn Mathematics and Science, R-3928-NSF, RAND, July 1990 (Oakes, Ormseth, Bell, and Camp).

Baseline Nonresponse in Project ALERT: Does it Matter?, N-2933-CHF, The RAND Corporation, Santa Monica, California, April 1990 (Bell, Gareleck, and Ellickson).

Prospects for Preventing Drug Use Among Young Adolescents, R-3896-CHF, The RAND Corporation, Santa Monica, California, March 1990 (Ellickson and Bell).

The Role of Professional Background, Case Characteristics, and Protective Agency Response in Mandated Child Abuse Reporting, R-3825-HHS, The RAND Corporation, Santa Monica, California, January 1990 (Zellman and Bell).

Results from the Evaluation of the Massachusetts Nursing Home Connection Program, JR-01, The RAND Corporation, Santa Monica, California, October 1989 (Buchanan, Kane, Garrard, Bell, Witsberger, Rosenfeld, Skay, and Gifford).

A Matched Sampling Algorithm for the Nursing Home Connection Demonstration, N-2823-HCFA, The RAND Corporation, Santa Monica, California, July 1989 (Buchanan, Bell, Witsberger, Kane, Garrard, Rosenfeld, and McDermott).

Provider Visit Patterns to Nursing Home Patients, N-2824-HCFA, The RAND Corporation, Santa Monica, California, June 1989 (Buchanan, Witsberger, Bell, Kane, Garrard, and Rosenfeld).

The Financial Impact of Nursing Home-Based Geriatric Nurse Practitioners, An Evaluation of the Mountain States Health Corporation GNP Project, R-3694-HCFA/RWJ, The RAND Corporation, Santa Monica, California, May 1989 (Buchanan, Arnold, Bell, Witsberger, Kane, Garrard).

Designing and Implementing Project ALERT, A Smoking and Drug Prevention Experiment, R-3754-CHF, The RAND Corporation, Santa Monica, California, December 1988 (Ellickson, Bell, Thomas, Robyn, and Zellman).

Assessing the Outcome of Affirmative Action in Medical Schools, A Study of the Class of 1975, R-3481-CWF, The RAND Corporation, Santa Monica, California, August 1987 (Keith, Bell, and Williams).

The Cost and Effectiveness of School-Based Preventive Dental Care, R-3203-RWJ, The RAND Corporation, Santa Monica, California, April 1985 (Klein, Bohannon, Bell, Disney, Foch, and Graves).

The Dynamic Retention Model, N-2141-MIL, The RAND Corporation, Santa Monica, California, April 1985 (Fernandez, Gotz, and Bell).

The Reliability of Clinical and Radiographic Examinations in the National Preventive Dentistry Demonstration Program, R-3138-RWJ, The RAND Corporation, Santa Monica, California, June 1984 (Klein, Bell, Bohannon, Disney, and Wilson).

Treatment Effects in the National Preventive Dentistry Demonstration Program, R-3072-RWJ, The RAND Corporation, Santa Monica, California, February 1984 (Bell, Klein, Bohannon, Disney, Graves, and Madison).

Outcome-Based Reimbursement for Nursing-Home Care, R-3092-NCHSR, The RAND Corporation, Santa Monica, California, December 1983 (Kane, Bell, Hosek, Riegler, and Kane).

The Military Application Process: What Happens and Can it be Improved?, R-2986-MRAL, The RAND Corporation, Santa Monica, California May 1983 (Berryman, Bell, and Lisowski).

Predicting the Course of Nursing Home Patients: A Progress Report, N-1786-NCHSR, The RAND Corporation, Santa Monica, California, January 1982 (Kane, Riegler, Bell, Potter, and Koshland).

Results of Baseline Dental Examinations in the National Preventive Dentistry Demonstration Program, R-2862-RWJ, The RAND Corporation, Santa Monica, California, April 1982 (Bell, Klein, Bohannon, Graves, and Disney).

CETA: Is it Equitable to Women?, N-1683-DOL, The RAND Corporation, Santa Monica, California, May 1981 (Berryman, Chow, and Bell).

Plan for the Analysis of Dental Examination Data in the National Preventive Dentistry Demonstration Program, N-1658-RWJ, The RAND Corporation, Santa Monica, California, April 1981 (Klein and Bell).

Medical School and Physician Performance: Predicting Scores on the American Board of Internal Medicine Written Examination, R-1723-HEW, The RAND Corporation, Santa Monica, CA, August 1977 (Bell).

1

1 BEFORE THE NORTH CAROLINA
2 UTILITIES COMMISSION
3 DOCKET NO. P-55 SUB 1022
4
5

6 In the matter of:

7 Application of BellSouth
8 Telecommunications, Inc.
9 to Provide In-Region InterLATA
10 Services pursuant to Section 271
11 of the Telecommunications Act
12 of 1996
13 -----

14 DEPOSITION OF
15 ALAN J. SALZBERG
16
17 September 24, 2001
18 3:00 p.m.

19 1701 Market Street
20 Philadelphia, Pennsylvania
21

22 By: Tammera M. Witte, RPR, CSR
23
24
25

2

1 A P P E A R A N C E S:

2

3 McKENNA & CUNEO
4 BY: TAMI LYN AZORSKY, ESQ.
5 1900 K. Street N.W.
6 Washington, D.C. 20006
7 (202) 496-7573
8 Appearing on behalf of AT&T

9 PAUL, HASTINGS, JANOFKY & WALKER
10 BY: WILLIAM B. HILL, JR., ESQ.
11 600 Peachtree Street, NE
12 Atlanta, GA 30308
13 (404) 815-2276
14 Appearing on behalf of KPMG Consulting

15 JESSE L. FENNER, ESQ.
16 1676 International Drive
17 McLean, VA 22102
18 (703) 747-4018
19 Appearing on behalf of KPMG Consulting

20 V I A T E L E P H O N E:

21 FREDERICK MC CULLUM, ESQ.
22 BellSouth Legal Department
23 675 W. Peachtree Street, Suite 4300
24 Atlanta, GA 30375
25 Attorney for BellSouth
 Telecommunications

 A L S O P R E S E N T:

 ROBERT BELL, Representative of AT&T

3

1 I N D E X

2

3 WITNESS

PAGE

4 ALAN J. SALZBERG

5 Direct Examination by Ms. Azorsky 4

6
7
8
9
10 EXHIBITS

11 (No exhibits marked.)
12
13
14
15
16
17
18
19
20
21
22
23
24
25

4
1 ALAN J. SALZBERG,
2 business at Quantitative Solutions, 55 Broad
3 Street, 20th Floor, New York, New York, having
4 been first duly sworn according to law, by the
5 Notary Public, testified as follows:
6

Alan J. Salzberg

1 that you do to verify that. You make sure they
2 made certain system changes. You might go to
3 verify that, as I mentioned before with running
4 one transaction through, for instance, for error
5 clarification timeliness, it might be true
6 initially that they simply could not perform this
7 at all for one of these products, so you have
8 zero out of 100 or something.

9 They make a change and you run
10 through the first three and all three of them
11 they're able to do it, then in all likelihood all
12 that's happened is they've added a line to some
13 table that says to look up this product or
14 something.

15 And the statistical test might
16 still be relevant, but it's not really that
17 important because you are pretty sure they fixed
18 the problem. So it depends on the context of
19 the --

20 Q. So is it your understanding that
21 the military-style test philosophy doesn't mean
22 that you will redo statistical tests each time?

23 A. That's my understanding. It's not
24 a wholesale -- it doesn't mean you have a
25 wholesale retest. But I'm not an expert on

Alan J. Salzberg

20 A. The answer is yes.

21

22 (A short recess was taken.)

23 THE WITNESS: I wanted to clarify

24 something. There was a question earlier

25 where I tried to explain two things that you

96

Alan J. Salzberg

1 would look for in a test; one which was the
2 power being bigger than the type one error;
3 the other which I think I misstated is that
4 as a sample size goes to infinity, the power
5 for any particular alternative goes to one.

6 Q. I don't think that changes anything.

7 I mean what that means is that as the sample size
8 gets bigger you reduce the probability of
9 observing type two errors. Or am I wrong?

10 A. Right.

11 Q. I'm right?

12 A. All else being equal.

13 Q. All else being equal, as the sample
14 size increases you reduce the probability of
15 observing type two errors?

16 A. Right.

17 Q. We were talking about
18 representative samples. Would you agree that for
19 an OSS test conducted in one state to be
20 persuasive for another state, the service for
21 CLECs in the state in which the test would be
22 conducted would have to be the same as the

2 percent. Most lay people would interpret that to
3 mean what is the likelihood of it being 95
4 percent. Statisticians often argue about how
5 exactly to interpret it, so that's why I
6 hesitate. It is used for statistical tests, that
7 P value.

8 Q. And it does predict how probable it
9 is that BellSouth's actual performance could be
10 better than the observed performance?

11 A. Well, I would answer no. No. I
12 tried to explain the distinction, so I think with
13 the explanation I gave I would answer no.

14 Q. Would you agree with me that if
15 BellSouth's observed performance is at 90.4
16 percent, that their true performance could be
17 worse than that?

18 A. Yes.

19 Q. Is there a way to calculate how
20 much worse than the 90.4 percent BellSouth's
21 performance could be?

22 A. If you define what you mean by
23 "could be," maybe. Definitely if you define
24 better what you mean by "could be." Otherwise I
25 would say it could be anything above zero and

79

Alan J. Salzberg

1 less than 100.

2 Q. Could you calculate the probability
3 that BellSouth's performance would be at 80
4 percent if their observed performance is at 90

1 sample sizes generally lead to narrower
2 confidence intervals?

3 A. Yes.

4 Q. Would you agree with me that with a
5 small sample a test has a high probability of
6 producing a significant result only if the null
7 hypothesis is very wrong?

8 A. There's a lot of words in there
9 that are very, that are not precise. So I would
10 say yes. But you have to look at all the words
11 that aren't precise in there to define small, to
12 define very wrong, things like that. But yes,
13 people are going to disagree about how those
14 words are defined.

15 Q. So what you are saying is that it's
16 relative but the concept is accurate?

17 A. The smaller the sample size, the
18 less precise, in general the less precise your
19 results are going to be.

20 Q. Would you agree with me that once
21 the test and the significance level are chosen,
22 that you can calculate the chance of rejecting
23 the null hypothesis if a specific alternative
24 hypothesis is true?

25 A. Once the test and the significance

17 Georgia test in assuring that the samples were
18 representative?
19 A. I don't think so.
20 Q. Who would have?
21 A. Could be Ted Glickman again.
22 Q. Would it necessarily have been a
23 statistician?
24 A. It may not have been for a lot of
25 transaction tests, because I think that they

95

Alan J. Salzberg

1 tried to get a representative group of scenarios
2 and test those scenarios. So they get a group of
3 scenarios I think that covers all the possible
4 things, activities that they want to test.
5 Q. And we talked about the discussion
6 we have had today being premised on the fact that
7 this is a random sample representative. Would
8 you agree that a representative random sample
9 makes a test more persuasive than if the sample's
10 not representative?
11 Let me restate that. Would you
12 agree with me that the random representative
13 sample makes a test more persuasive than a sample
14 that is not necessarily representative?
15 A. Yes. We're talking about the
16 sample representing the universe. You are making
17 inferences about -- I think that's the way you
18 defined it at the beginning.
19 Q. Correct.

5 A. Yes.

6 Q. How is it affected by the sample

7 size?

8 A. The curve will shift upward towards

9 one as a sample size gets larger. If, assuming

10 that the test has certain properties that most

11 good statistical tests have.

12 Q. What are those properties?

13 A. Well, one thing is that the test be

14 -- what is it called? I'm trying to remember

15 what's called unbiased, which I'm trying to

16 remember the exact definition of that. Another

17 unbiased means that the probability of rejecting

18 is bigger than the probability, I believe

19 unbiased means probability of rejecting is bigger

20 than the probability of it accepting when, when

21 the state of the world is that it should be

22 rejected. But I could be getting that wrong.

23 Basically has to do with some things that seem

24 very obvious. One is that if they are failing --

25 I got that wrong actually.

91

Alan J. Salzberg

1 Q. Glad it was you and not me. Go

2 ahead and get it right.

3 A. One is that as sample size

4 increases you should get closer to the right

5 answer. You should reject more often if you

6 should be rejecting; you should accept more often

7 if you should be accepting.

**BEFORE THE
LOUISIANA PUBLIC SERVICE COMMISSION**

**LOUISIANA PUBLIC SERVICE COMMISSION,
ex parte**

DOCKET NO. U-22252-E

In re: Consideration and review of BellSouth Telecommunication, Inc.'s pre-application compliance with Section 271 of the Telecommunications Act of 1996, including but not limited to, the fourteen requirements set forth in Section 271(c)(2)(B) in order to verify compliance with Section 271 and provide a recommendation to the Federal Communications Commission regarding BellSouth Telecommunications, Inc.'s application to provide interLATA services originating in-region.

**KPMG CONSULTING, INC.'S MOTION FOR LEAVE TO ARTICULATE BASIS FOR
STATISTICAL ANALYSIS IN THE GEORGIA 271 TEST FINAL REPORTS**

1. **NOW COMES** KPMG Consulting, Inc. ("KPMG Consulting") and files this Motion for Leave to Articulate The Basis for Statistical Analysis in the Georgia 271 Test Final Reports (the "Georgia 271 Final Reports"). KPMG Consulting files this motion for the limited purpose of addressing the statistical methods used in the Georgia 271 Test Final Reports, upon suggesting as follows:
2. KPMG Consulting was retained by BellSouth Telecommunication, Inc. and the Georgia Public Service Commission to conduct an independent third party audit of the access BellSouth provides competitive local exchange companies ("CLECs") to BellSouth's operational support systems ("OSS") pursuant to its obligations under the Telecommunications Act of 1996. KPMG Consulting issued its Final and Supplemental Reports to the Georgia Public Service Commission on March 20, 2001.

3. KPMG Consulting understands that the Louisiana Public Service Commission (the "Commission") initiated this proceeding in response to BellSouth Telecommunications, Inc.'s Notice of Intent to File Section 271 Application with the Federal Communications Commission, which was filed with the Commission on April 20, 2001 and published in the Commission's Official Bulletin dated April 27, 2001.

4. Pursuant to the procedural schedule adopted by the Commission Staff in this matter, intervenors were to file reply comments and affidavits to BellSouth's comments and affidavits by June 8, 2001, subsequently amended to June 11, 2001. On or about June 8, 2001, AT&T Communications of the South Central States, Inc. ("AT&T") filed comments and affidavits in response to BellSouth's filing.

5. In its responsive filings, particularly in the Affidavit filed by Robert M. Bell, Ph.D., AT&T comments on the statistical analysis, among other things, used in the third party audit conducted by KPMG Consulting in Georgia. As an independent third party evaluator, KPMG Consulting is not a traditional intervenor in this proceeding and functions neither as a utility nor a public interest group. Instead, KPMG Consulting files this motion for the limited purpose of assisting the Commission in understanding the basis for KPMG Consulting's use of statistical analysis in the Georgia 271 Test Final Reports. Accordingly, KPMG Consulting does not file this motion to respond to the specifics of AT&T's affidavit, but only to address the statistical methods used in the Georgia 271 Test Final Reports.

6. As the author of the Georgia 271 Test Final Reports, no other party can adequately represent and articulate the basis for KPMG Consulting's use of statistical analysis in such reports. Rule 10 of the LPSC's Rules of Practice and Procedure allows

any party with a justiciable or administratively cognizable interest to appear in any proceeding before the Commission.

I. General OSS Test Design Considerations

The Georgia 271 OSS test was designed and implemented to cover a wide range of products and services. In total, well over 1,000 test points were reported in the eight major test categories: Pre-Ordering, Ordering and Provisioning, Billing, Maintenance and Repair, Capacity Management, Change Management, Metrics, and Flow-Through Evaluation.

In many cases, the measures related to these test points were quantitative, and statistical testing was performed. However, the sample sizes for each specific service or transaction type were not designed for statistical precision. Instead, the timeliness and accuracy issues were generally evaluated at an aggregate level, while functionality was evaluated at the specific level. Functionality tests, for example, do not determine how quickly or how accurately the system is performing a particular service or transaction type. Instead, functionality tests determine whether the system has the capability of performing the required service.

When statistical tests were used, the purpose was to *inform* KPMG Consulting's professional judgment, rather than to *determine* KPMG Consulting's professional judgment. The statistical test informed KPMG Consulting whether an observed difference could have been the result of random variation, or whether that difference was statistically significant. KPMG Consulting used professional judgment to determine, when a difference was statistically significant, if that difference was substantial enough to have an adverse impact on competition. Thus, the statistical test result, while often a key

component in the Satisfied/Not Satisfied decision, was not the only consideration in that decision.

The purpose of the Georgia 271 OSS test was not to determine, for the specific data created by KPMG Consulting, whether standards were being met. The purpose of ongoing monitoring efforts is to determine whether BellSouth is performing below a standard for a specific set of data. The Georgia 271 OSS test sought to determine whether the test outcomes were consistent with an OSS that is generally operating at or above an acceptable level, in order to provide CLECs with non-discriminatory service or a meaningful opportunity to compete. As such, random variation in test outcomes were necessarily considered, via statistical testing, during the OSS test, regardless of whether the appropriate standards were benchmarks or parity measures.

II. Statistical Analysis of Results Measured Against Commission-Established Benchmarks

In all of KPMG Consulting's tests to date, KPMG Consulting has established the Type I error (defined as the chance of concluding BellSouth is missing the standard when, in fact, they are not) at no more than 5%. When no statistical standards are applied to benchmark tests, the Type I error is as high as 50%. This error does not fall with sample size and KPMG Consulting deems such rate of error unacceptable. Type II error, is controlled through sample size, but in the Georgia 271 Test Final Reports, KPMG Consulting felt that the sample sizes were sufficient to control for Type II error, and thus no further analysis was needed. In order to form its judgments about the service provided by BellSouth to the CLECs, KPMG Consulting tested whether BellSouth's process, in general, was operating at the benchmark. The goal of ongoing monitoring may be to

determine whether, for a particular month and for a particular set of orders, the process operated at the benchmark. KPMG Consulting's test clearly called for a statistical test. In the case of ongoing monitoring, a statistical test may or may not be necessary. For the foregoing reasons, the test of the OSS needs to be distinguished from ongoing monitoring of the OSS through the reporting of monthly service quality measures.

III. Thoroughness of the Statistical Analysis Of Results

The Null Hypothesis for statistical testing was that BellSouth was meeting or exceeding the standard. This Null Hypothesis is consistent both with KPMG Consulting's previous methodologies, and with standard statistical practice. Therefore, a two-sided 90% confidence interval, if implemented, would have resulted in exactly the same statistical conclusions as KPMG Consulting made in the Georgia 271 Test Final Reports.

IV. Disaggregation

KPMG Consulting tested an extremely broad array of products and services for functionality. A functionality test addresses whether a particular aspect of the OSS is functioning. Statistical analysis tests are primarily used in areas where timeliness and accuracy are an issue. For that part of the test, rolling up the data to an aggregate level is appropriate, because the system operating on the data is not substantively different for every disaggregation. On this basis, KPMG Consulting did not believe that every disaggregation needed to be subject to statistical analysis.

V. Blindness

Absolute "Blindness" cannot be achieved in an OSS test. This is true for a variety of reasons. First, in all cases the ILEC is aware of the identity of the trading partner that submits an order through an electronic interface. All orders contain a data value that

identifies the source of the order so that responses can be returned to the correct trading partner. Second, by design, the wide variety of transaction types submitted by the pseudo-CLEC during the tests is much broader than the relatively narrow scope of order types submitted currently by real CLECs. This diversity would have been highly unusual, and easily spotted by BellSouth. During KPMG Consulting's test in Georgia, steps were taken to determine whether the same software, running on the same computing complexes, processed real and test orders. Further, no evidence has been produced to date, in any OSS test, that an ILEC purposely programmed its systems to correctly process pseudo-CLEC orders, and to incorrectly process orders for real CLECs. On the contrary, all evidence collected to date suggests that the interfaces provide the same functionality to all CLECs. Finally, in many cases (e.g. LNP orders) the transactions evaluated for the OSS test were live orders submitted by real CLECs. For non-transaction tests, such as process evaluations (e.g. hot cuts), it is not possible to make "blind" observations. In any event, in all important performance measures, regulators can monitor BellSouth's actual wholesale performance on an ongoing basis.

VI. Military Style Testing

In some cases in the Georgia test the retest sample sizes were smaller than the sample sizes of the initial tests. Retests were generally targeted to specific issues in specific testing domains; for example, to test confirmation timeliness. The size of the retest was established to test for this single purpose, and thus the sample size was typically smaller. KPMG Consulting notes that the initial sample sizes generally served the dual purpose of testing a particular part of the OSS, and preparing orders to test a downstream part of the OSS. For example, the initial data on measures related to order confirmation timeliness

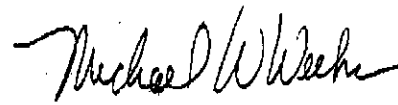
included orders that were later provisioned as part of the test. The reason KPMG Consulting sent through so many orders was not only to test order confirmation timeliness, but also to create the necessary components for the provisioning portion of the test. Finally, the fact that changes were made to the systems, documentation, methods, and/or procedures as a result of an Exception means that the revised test object was not the same as that originally tested. Typically, because it is more focused, the retest is more powerful than the original test.

VII. Use of Professional Judgment to Overrule Observed Data

KPMG Consulting believes it is appropriate to express its professional judgment with respect to passing or failing, when its judgment is different from what the performance standard states. This was the case for the SAQ pre-order time. KPMG Consulting stated in hearings before the Georgia Public Service Commissions that, technically, BellSouth failed this requirement, but that KPMG Consulting did not believe this failure is service-affecting in any way. Therefore, KPMG Consulting issued a "Satisfied" for that criterion. As stated above, the statistical result states whether the difference was statistically significant, but does not tell whether the difference was substantial enough to matter. KPMG Consulting used its professional judgment to determine whether any of the observed statistical differences would have an adverse impact on competition, in accordance with the mandate of Section 271 of the Telecommunications Act of 1996.

Accordingly, for the reasons set forth above, KPMG Consulting respectfully requests that the Commission grant KPMG Consulting's Motion to Articulate The Basis for Statistical Analysis and consider the foregoing analysis in the Commission's review in this proceeding of the Georgia Section 271 Test Final Reports.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael Weeks", written in a cursive style.

Michael Weeks
Managing Director
KPMG Consulting, Inc.
8725 West Higgins Road
Chicago, IL 60631
(773) 255-6654

June 25, 2001